

UNIVERSITI TEKNOLOGI MARA

**CHEMICAL CHARACTERISTICS OF
PIGMENT COLORANT OF
*QUERCUS INFECTORIA***

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ABSTRACT

An iron-gall ink is made with the tannin extracts (colorant components) from *Quercus infectoria* and is observed using UV-Vis spectroscopy and was analysed with Fourier transform infrared spectroscopy (FTIR). The aim of the study was to investigate the method of extracting the gallotannic acid from *Quercus infectoria* together with the production of iron-gall ink and characterized its properties. The UV-Vis analysis was successful in characterizing the ink and the maximum absorbance is obtained, whereas the FTIR analysis revealed the peaks of functional groups that presents in the ink. The UV-Vis spectroscopy analysis shows the presence of the highest peak at 328 nm, close to the spectrum of violet (400 nm). UV-Vis spectral data were mainly produced by the colorant components (i.e., dyes) found in the ink. While the FTIR data shows a broad peak at 3293 cm^{-1} , indicating the presence of -OH stretch and also there is a presence of aromatic compound.

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CHAPTER ONE

INTRODUCTION

1.1 RESEARCH BACKGROUND

Since the olden days, dyes are extracted from natural dyes and have been broadly used in many applications such as the coloration of textile and so on. Nevertheless, as time passes by and the modernisation of civilisation that increases over the centuries; the artificial dyes that are man-made, resulting in a rise on its market due to the multiplicity and viable properties of artificial dyes. The properties are the variety of colours, the capability in dyeing synthetic fibres, lower cost and ease of handling in large scale in the industry. With this advent in the history of dyes, the use of natural dyes has been slowly fading over the years as artificial dyes are preferably industrialized by mankind. However, like the norm in life, artificial dyes has shown its weaknesses when compared to natural dyes as it has raises several serious harms for the human health as well as the environment itself.

Concerning on the issue at hand, there is now global awareness for the production of artificial dyes and a convincing global interest on the production of dyes from natural sources that comes from a variety of microorganisms and plants. A lot of researches have been done in recent years on the extraction, purification, refinement and modification processes of natural dyes as well as their consequent application in the industries, which validates the redevelopment of natural dyeing and finishing. The viable properties of natural dyes; such as higher dyestuff quality, environmental friendly, high colour fastness, cheapness, long-term colour stability and authentic property as well as low cost has made the usage of natural dyes in a number of applications in the industry grown larger over time.